

Name: _____

Date: _____

Exam: Function Reflections (Solution version 627)

1. (worth 9 points) Let function f be defined by the polynomial below:

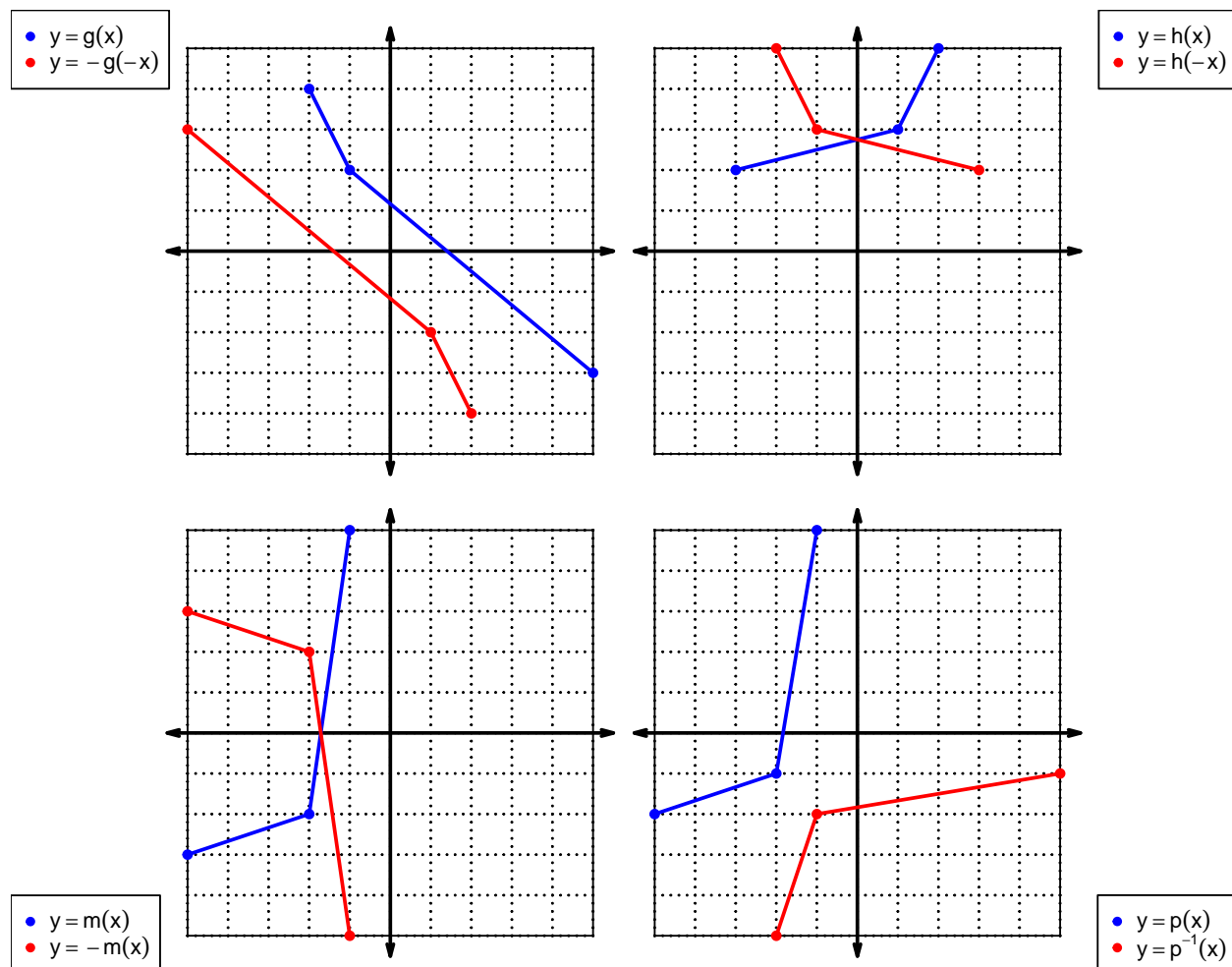
$$f(x) = 6x^4 - 2x^3 - 3x^2 - 5x - 8$$

Draw lines that match each function reflection with its polynomial:

Reflections**Polynomials**

$f(-x)$	●	●	$-6x^4 - 2x^3 + 3x^2 - 5x + 8$
$-f(-x)$	●	●	$6x^4 + 2x^3 - 3x^2 + 5x - 8$
$-f(x)$	●	●	$-6x^4 + 2x^3 + 3x^2 + 5x + 8$

2. (worth 20 points) In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



Exam: Function Reflections (Solution version 627)

For all questions on this page, the functions f , g , and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	2	8	4
2	3	6	7
3	8	7	5
4	1	9	8
5	7	3	1
6	6	4	9
7	4	1	6
8	9	5	2
9	5	2	3

3. (worth 3 points) Evaluate $g(4)$.

$$g(4) = 9$$

4. (worth 3 points) Evaluate $h^{-1}(2)$.

$$h^{-1}(2) = 8$$

5. (worth 3 points) Assuming g is an **even** function, evaluate $g(-1)$.

If function g is even, then

$$g(-1) = 8$$

6. (worth 3 points) Assuming f is an **odd** function, evaluate $f(-7)$.

If function f is odd, then

$$f(-7) = -4$$

Exam: Function Reflections (Solution version 627)

7. (worth 15 points) A function, f , is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g , is **odd** if $g(x) = -g(-x)$ for all x in the domain.

Let polynomial p be defined with the following equation:

$$p(x) = -x^2 - x$$

- a. Express $p(-x)$ as a polynomial in standard form.

$$p(-x) = -(-x)^2 - (-x)$$

$$p(-x) = -x^2 + x$$

- b. Express $-p(-x)$ as a polynomial in standard form.

$$-p(-x) = -(-x^2 + x)$$

$$-p(-x) = x^2 - x$$

- c. Is polynomial p even, odd, or neither?

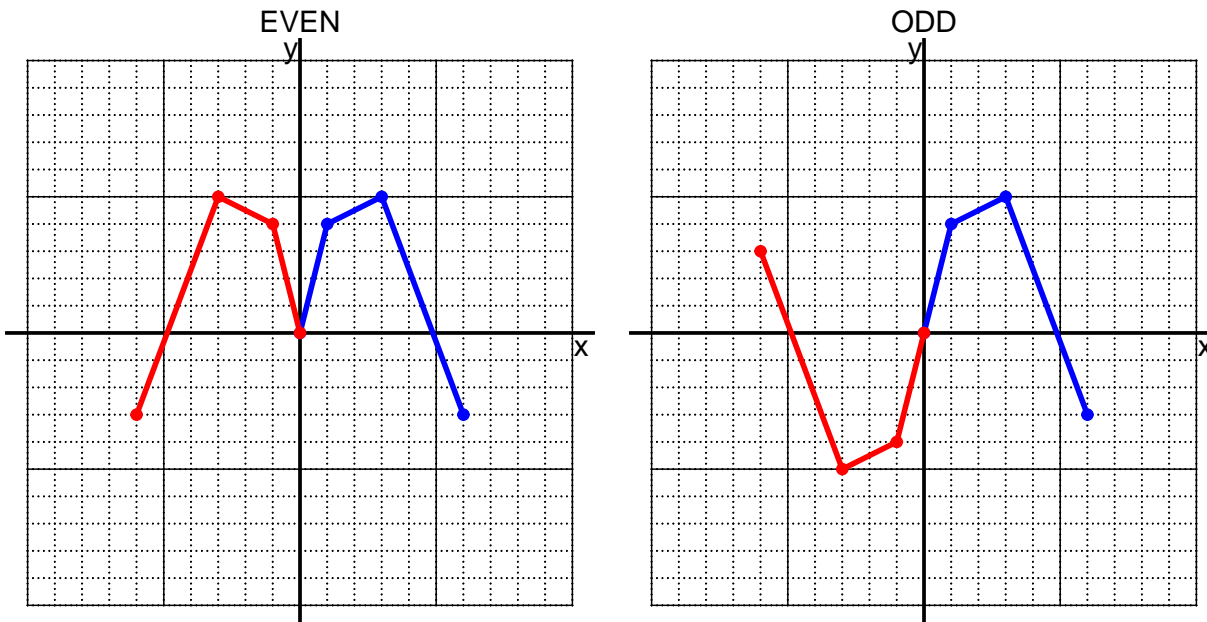
neither

- d. Explain how you know the answer to part c.

We see that $p(x)$ is not equivalent to either $p(-x)$ or $-p(-x)$, so p is neither even nor odd.

Exam: Function Reflections (Solution version 627)

8. (worth 10 points) I have drawn half of a function. Draw the other half to make it even or odd.



9. (worth 10 points) Let function f be defined with the equation below.

$$f(x) = 6(x + 3)$$

- a. Evaluate $f(11)$.

step 1: add 3
step 2: multiply by 6

$$\begin{aligned} f(11) &= 6((11) + 3) \\ f(11) &= 84 \end{aligned}$$

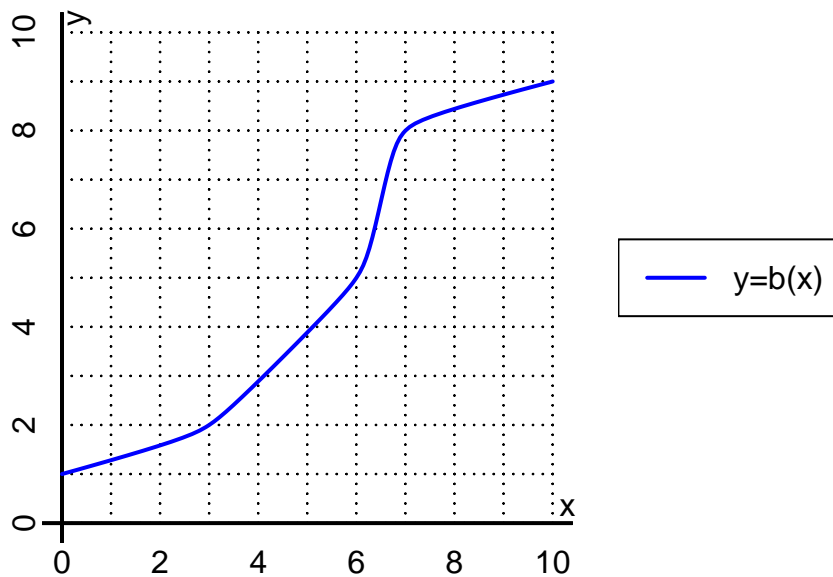
- b. Evaluate $f^{-1}(96)$.

step 1: divide by 6
step 2: subtract 3

$$\begin{aligned} f^{-1}(x) &= \frac{x}{6} - 3 \\ f^{-1}(96) &= \frac{(96)}{6} - 3 \\ f^{-1}(96) &= 13 \end{aligned}$$

Exam: Function Reflections (Solution version 627)

10. (worth 6 points) The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(3)$.

$$b(3) = 2$$

b. Evaluate $b^{-1}(5)$.

$$b^{-1}(5) = 6$$

Exam: Function Reflections (Solution version 627)

11. (worth 18 points) Function f is defined by the table below.

a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	4	-4	4	-4
-1	-5	5	-5	5
0	0	0	0	0
1	-5	5	-5	5
2	4	-4	4	-4

b. Is function f even, odd, or neither?

even

c. How do you know the answer to part b?

Function f is even because column $f(-x)$ matches column $f(x)$ exactly.